ADDENDUM TO THE TCFD REPORT 2023

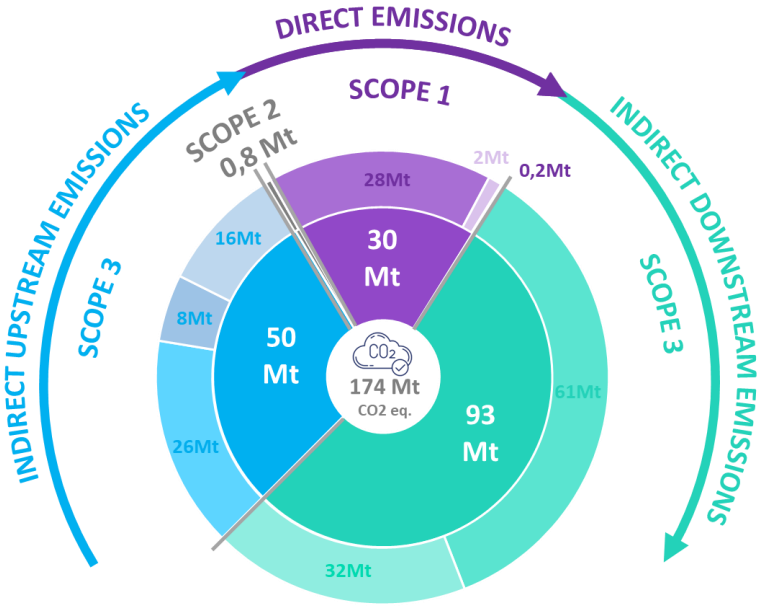
Prior to its General Assembly of April 26, 2023, ENGIE has prepared this addendum to its climate notebook-TCFD report. The purpose of this document is to provide further insight into the Group's climate strategy in response to certain requests from its stakeholders.

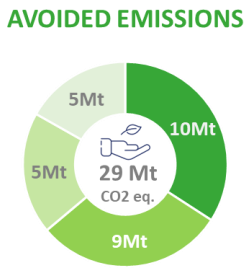
The ENGIE Group is committed to be Net Zero Carbon by 2045 on its 3 scopes, following a *well-below 2°C* 2030 trajectory, certified by SBTi since February 2023. To do this, the Group has set public objectives which cover 99% of its carbon footprint (scopes 1,2 and 3).

Concretely, the Group, which had already withdrawn from exploration-production activities for years, has officially stated its worldwide coal phase out in 2027. To reach Net Zero, the Group shall gradually transform its energy production model by investing massively in the production of renewable electricity. These technologies may be subject to intermittency issues, that is why they require flexibility solutions such as the storage of energy in the form of electrons or in the form of gas. In the short and medium term, the latter has the ability to be stored and distributed on demand and is an essential element of the resilience of energy systems, particularly in periods of peak demand. The Group plans to gradually green this gas by replacing it with the sustainable alternatives of biomethane and green hydrogen.

To lead this major transformation, the Group has set growth investment objectives of €22 to €25 billion for the next 3 years, of which 75% are aligned with the European taxonomy.

ENGIE has a quantified and certified carbon footprint, of which emissions related to energy production activities and the sales of gas, electricity and heat represent more than 80%.





Scope 3 Upstream:
- 26Mt Purchased energy sold to end users
- 8Mt Procurement & capital goods
- 16Mt Upstream chain of fuel & electricity

Scope 2:
- 0.8Mt Purchased electricity & heat

Scope 1:
- 28Mt Energy generation
- 2Mt Gas infrastructures
- 0.2Mt Other activities (incl. vehicle fleet)

Scope 3 Downstream:
- 61Mt Use of sold products (fuel sales)
- 32Mt Investments (incl. energy generation of equities)

Decarbonization of clients:
- 10Mt Renewable energy & gas generation
- 9Mt Resales of renewable energy & gas
- 5Mt Decentralized energy utilities
- 5Mt Energy certificates & carbon credits

Figures in Mt CO_2eq.

ENGIE's carbon footprint on its 3 scopes (1,2 and 3), amounts to 174 Mt CO_2eq. in 2022. This balance sheet has been reduced by 86Mt CO_2eq. since 2017, i.e. a 33% decrease.

ENGIE is committed to achieving Net Zero Carbon in 2045 by following a *well-below 2°C* trajectory certified in February 2023 by SBTi, thanks to 4 operational levers.

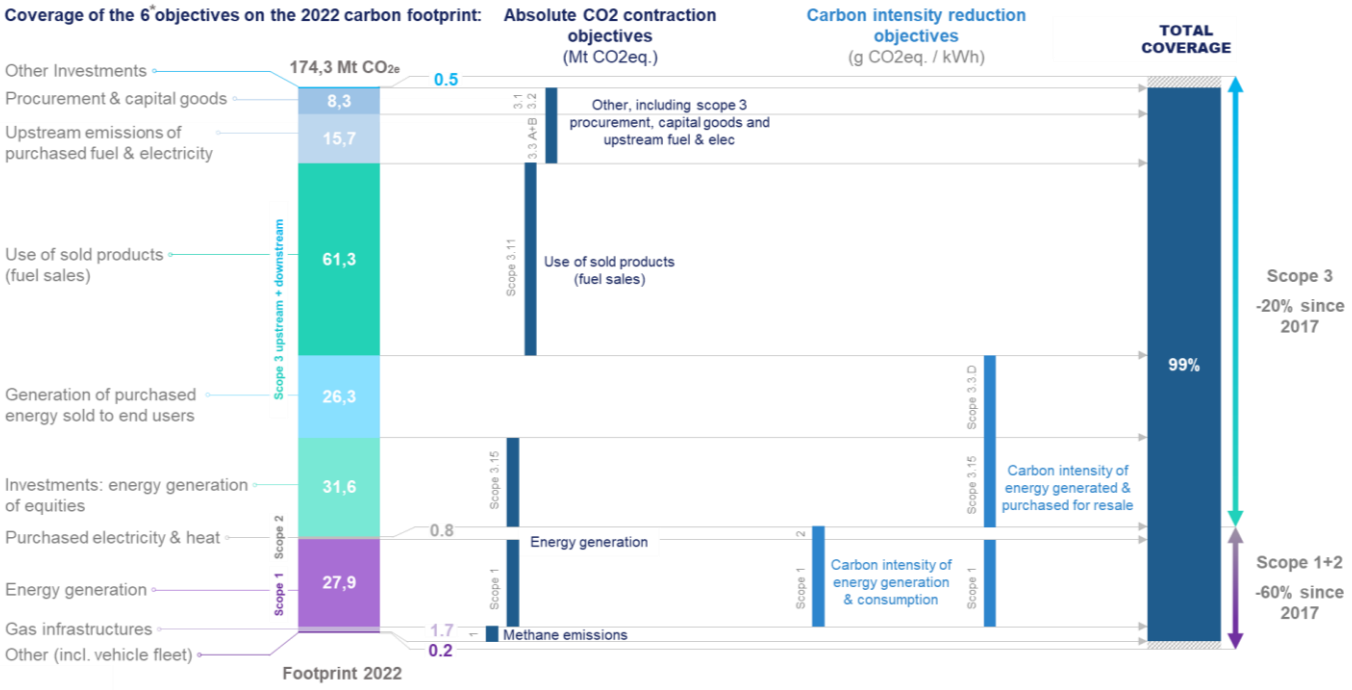
This commitment materializes first and foremost through a strategy to reduce its direct (scope 1) and indirect (scopes 2 and 3) greenhouse gas emissions. A GHG (Greenhouse Gas) steering governance has been put in place and budgets have been allocated to each of the business lines for the conduct of their operations as well as their investments (see page 75 of the integrated report – appendix TCFD) .

The Group's Net Zero commitment will lead to a reduction of *at least* 90% of greenhouse gas emissions between 2017 and 2045. Regarding the 10% of residual emissions, ENGIE intends to minimize the volume, and is working in parallel to the definition of its neutralization strategy by increasing carbon sinks. The priority remains for the Group to focus its efforts on actions to reduce its emissions.

The Group bases its strategy between now and 2030 on four operational levers: 1- coal phase out, 2- development of renewable energies; 3- reduction and greening of the volumes of gas consumed and sold 4- energy storage (details on page 32-33 of the integrated report). The combination of these levers should enable the greening of the energy mix while correcting the effects of intermittency inherent to renewable energies through flexibility solutions such as energy storage. The use of our thermal power plants will progressively evolve so that they are mainly mobilized to meet peak demand.

To date, 99% of the Group's emissions are covered by a decarbonization objective by 2030, either within the framework of the *well-below 2°C* certification, or within the framework of objectives for which the Group had already voluntarily subscribed publicly. As part of the SBTI certification process (2°C in 2020 and *well-below 2°C* since February 2023), the Group's decarbonization objectives have not been structured by scopes 1,2,3 but by type of activity (eg: energy production and consumption, gas sales or electricity sales, etc.) expressed in absolute value or in intensity ($gCO_2eq.$ / kWh).

The graph below reconciles the approach by scope and by activity and thus makes it possible to visualize the portion of the carbon footprint covered by each 2030 decarbonization objective.

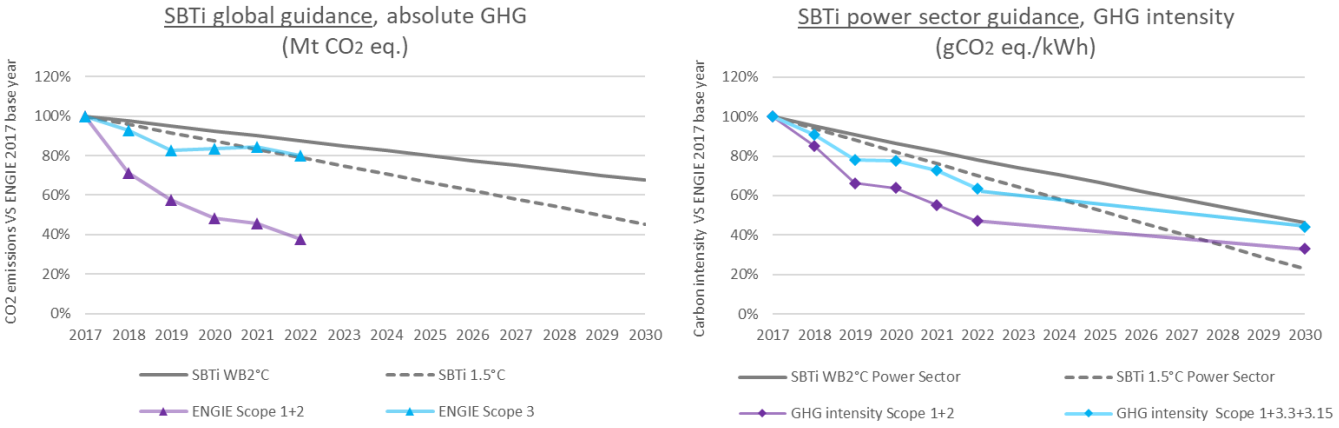


Figures in Mt $CO_2eq.$

* The Group also has a 2030 Net Zero objective on its ways of working (IT, business travel, employee commuting, building consumption) which represents 0.15% of the carbon footprint in 2022.

ENGIE goes beyond the *well-below 2°C* for which it is certified by SBTi , but with a trajectory that does not reach 1.5°C at this stage.

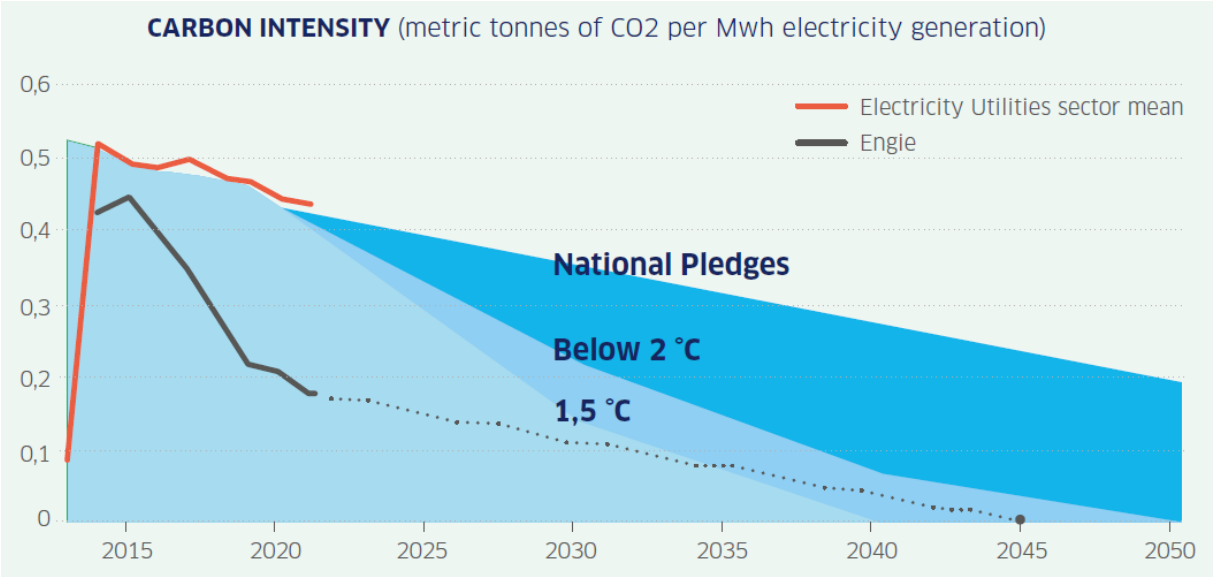
In its overall guidance (all sectors combined – graph 1) for a 1.5°C certification, SBTi requests a linear reduction of 4.2% per year on scopes 1 and 2, as well as *well-below 2°C* reduction on its scope 3 (2.5% per year). ENGIE meets these criteria. However, more ambitious targets are required of companies in the *Power sector* (graph 2) on the generation and sales of electricity and heat, on which ENGIE is not aligned. Below, the gap from the Group's trajectory with a global warming limited to 1.5°C according to SBTi :



For energy production activities, being aligned with 1.5°C would require increasing the reduction of scope 1+2 emissions related to energy production and consumption from -66% to around -78% between 2017 and 2030. Committing to this reduction would require the sale of current thermal power plants as they are necessary, in the short term, to the resilience of energy systems to which they contribute. These assets would therefore continue to emit greenhouse gases. ENGIE is in the best position to decarbonize these assets given its positioning in renewable gas technologies.

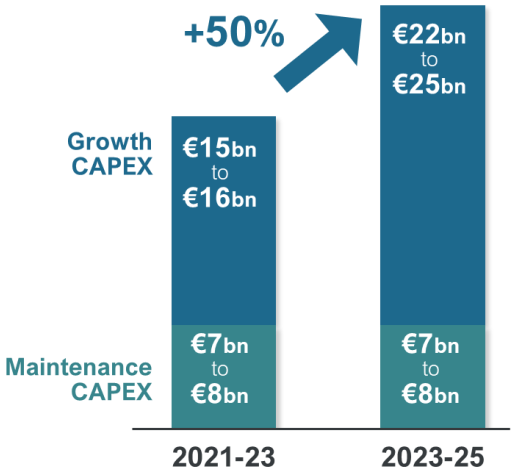
On energy sales, the 1.5°C trajectory would require increasing the reduction target linked to energy sales from -56% to around -80% between 2017 and 2030. ENGIE communicated for the first time on the emissions related to purchased energy sold to end-users in 2022 This indicator is therefore recent and requires more maturity in terms of data before exploring potential additional decarbonization levers.

To be noted, several benchmarks coexist to analyze the gap with a 1.5°C trajectory. Indeed, the Group is aligned with such a trajectory by 2030 when compared to the IEA's *Net Zero Emissions 2022* scenario, reference used by the Transition Pathway Initiative to assess the alignment of companies of the energy sector (see graph below). This shows the complexity of communication on the subject, without a reference framework commonly shared by the entire international community. Source: TPI – ENGIE



ENGIE is committing financial resources in line with its decarbonization ambition.

To deliver its ambitions, ENGIE is committed to align all of its CAPEX with its decarbonization strategy. Over the 2023-2025 period, €22 to €25 billion in growth investments are anticipated (+50% compared to 2021-2023 period)



At least 75% of these growth investments are aligned with the European taxonomy. This corresponds in particular to the development of:

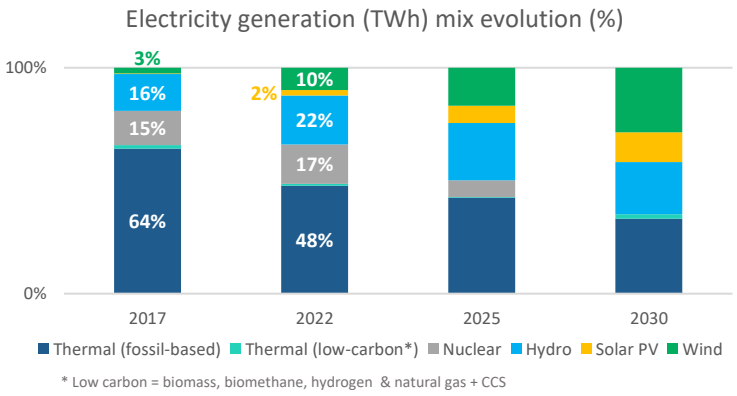
- The production of renewable wind, solar and hydraulic electricity (€13 to 14 billion),
- Production of green gases (biogas, biomethane and hydrogen) and related infrastructures as well as storage capacities such as batteries (€2 to 3 billion)
- Infrastructures (electric transport, low-carbon mobility and heating and cooling networks) (between €1 and €2 billion)

Regarding the 25% not aligned with the European taxonomy:

- Between 5 and 10% relate to centralized or decentralized generation assets which today operate with fossil gas, but which have the capacity to decarbonize by 2045. These are either investments aimed at optimizing their efficiency and reducing their greenhouse gas emissions, i.e. additional capacities necessary to bring flexibility to the electricity system (partly remunerated via a capacity-based remuneration mechanism)
- Between 5-10% concern gas infrastructures. Given the thresholds of the taxonomy, these infrastructures are not considered eligible to date, but will change over time with the increase in the volumes of renewable gas in the networks. In addition, these projects respond to requests whose execution are made mandatory by the European regulatory system: connections to new customers and strengthening and improvement of existing networks, including digitization measures.
- Finally, part of the CAPEX is not covered by the European taxonomy (between 5-10%). This notably includes desalination solutions or the development of digital solutions.

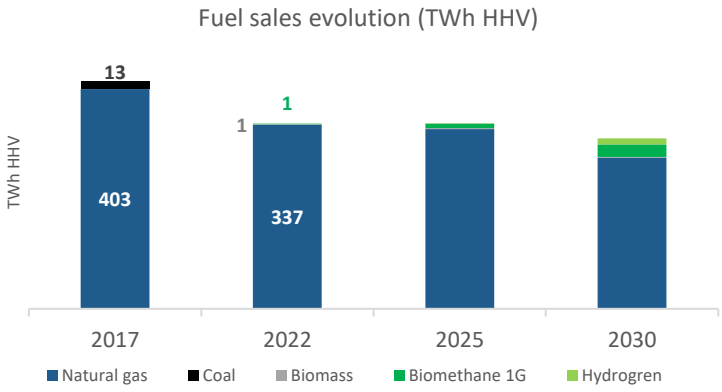
These investments allow the Group to continue to decarbonize its energy production.

Renewable electricity (wind, hydraulic and solar) will develop very widely to reach around 65% of ENGIE's production in 2030. Low-carbon thermal electricity (electricity from biomass, biomethane, renewable hydrogen, as well as natural gas + CCS) will accelerate its development from 2030 and will then represent between 5 to 10% of the fuel consumed. As a reminder, the Group has an objective of 43Mt CO_2eq. in 2030 linked to energy generation.



Fuel sales will also be strongly decarbonized.

Three main factors contribute to the decarbonization of fuel sales: cessation of coal sales since 2017, reduction in fossil gas sales (linked to energy sobriety and efficiency as well as the transfer to other energy vectors), greening of sales (biomethane and renewable hydrogen). This last lever will build up between 2022 and 2030, before becoming the first decarbonization lever between 2030 and 2045. The share of renewable gases should represent at least 10% of the Group's gas sales by 2030. As a reminder, the Group has an objective of 52Mt CO_2eq. in 2030 linked to use of sold products (fuel sales).



Thus, in parallel with the development of renewable electricity, the Group's energy mix is decarbonizing over the period 2017-2030, thanks to the end of coal consumption and a 30% reduction of natural gas consumption for both energy generation and fuel sales.

Furthermore, the rate of greening of the gas transported and distributed by the Group will largely depend on public policies and the regulatory framework in place. The current gas flows from the gas distribution and transport networks in France already include a share of biomethane; proportion that will grow in the coming years, to reach 100% renewable gas by 2050. ENGIE has also committed to reducing methane emissions from its controlled gas infrastructures around the world by 30% between 2017 and 2030.

The Group's decarbonization ambitions are underpinned by ambitious gas greening targets, as well as the provision of both decarbonization and energy system flexibility solutions.

The Group is largely committed to the development of new technologies, and in particular to biomethane, renewable hydrogen and batteries, with in 2030:

- ~10 TWh of annual biomethane production capacity in Europe
- ~30 TWh/year of biomethane sold
- ~50 TWh of annual biomethane production capacity connected to ENGIE networks in France
- 4 GW of renewable hydrogen production capacity by electrolysis
- 700 km of network dedicated to hydrogen
- 1 TWh of H_2 storage capacity
- 30 TWh of hydrogen in the energy management portfolio
- + 100 hydrogen vehicle charging stations
- 10 GW of battery capacity

The Group will invest ~10% of its development CAPEX between 2023 and 2025 in batteries and green molecules. Between now and 2030, €4 billion will be invested in hydrogen and €2.5 billion for biomethane connections to the networks.

Appendix 1: Understanding the carbon footprint of liquefied natural gas.

Following the war in Ukraine, ENGIE had to renew 20% of its supply contracts in 2023. The strategy of renewing the Group's natural gas supply portfolio is compatible with a decreasing demand for natural gas in Europe between now and 2045. This strategy includes the mobilization of additional volumes from the North Sea, as well as new LNG contracts put in place with companies, particularly American ones.

Based on internal data available to date, for the entire life cycle from extraction to combustion, the difference in emissions between LNG from the USA and natural gas from Russia is estimated at approximately 10 %.

These contracts do not call into question the Group's ability to achieve its Net Zero objective by 2045, nor its greenhouse gas emissions objectives for 2030 and end before 2045. In the meantime, they offer to the Group the flexibility to be able to reroute these volumes.

Appendix 2: ENGIE's carbon footprint and 2017 and 2022.

Emissions (tCO2eq.)	2017	2022	Evol. 2017-22
Scope 1	**80 489 233**	**29 832 102**	
Energy generation	76 377 307	27 917 242	
Gas infrustructures	2 625 857	1 724 521	
Methane emissions from gas infrastrctures	2 069 736	1 263 608	
Other emissions from gas infrastrctures	556 121	460 913	
Other activities	1 486 068	190 340	
Scope 2	**916 698**	**751 862**	
Scope 3	**179 335 290**	**143 706 215**	
1. Procurement of goods and services	14 868 671	5 466 061	
2. Capital goods	2 947 153	2 820 358	
3. Fuel- and energy-related activities	51 867 244	41 978 623	
Upstream emissions of purchased fuels and electricity	25 757 416	15 727 752	
Generation of purchased energy that is sold to end users	* 26 109 828	26 250 871	
11. Use of sold products (fuel sales)	79 515 748	61 304 676	
15. Investments	30 136 474	32 136 497	
Energy generation of equities	30 136 474	31 626 021	
Other investments	-	510 476	
TOTAL scopes 1, 2 and 3	**260 741 220**	**174 290 178**	-33%

* Value subject to change, audited for the first time in 2022, pending an update of the calculation methodology

In addition, GHG emissions related to ways of working are monitored as part of a specific objective (Net Zero by 203). This includes in particular emissions related to business travel (scope 3.6: 26,762 t CO_2eq. in 2022) and employee commuting (scope 3.7: 66,222 t CO_2eq. in 2022).